

Indigenous and scientific knowledge: some critical comments

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The distinction between indigenous and Western/scientific knowledge can present problems for those who believe in the significance of indigenous knowledge for development. This article examines some of the contradictions and ironies involved in accenting the importance of indigenous knowledge, with a view to eliciting a dialogue on the subject. The last part of the article tentatively explores a number of possible ways out of the dilemma.

Introduction

In the decades since the Second World War, the rhetoric of development has gone through several stages--from its focus on economic growth, to growth with equity, to basic needs, to participatory development, to sustainable development. (Bates, 1988; Black, 1993; Hobart, 1993; Watts, 1993). Today indigenous knowledge is seen as pivotal above all in discussions on sustainable resource use and balanced development (Brokensha et al., 1980; Compton, 1989; Gupta, 1992; Niamir, 1990; Warren, 1990). This orientation is in stark contrast to the views of many earlier theorists, who saw traditional knowledge and institutions as obstacles to development.

The focus on indigenous knowledge clearly heralds a long overdue move. It represents a shift away from the preoccupation with the centralized, technically oriented solutions of past decades, which failed to improve the prospects of most of the world's peasants and small farmers. By highlighting the possible contribution to be made by the knowledge which is in the hands of the marginalized poor, current literature focuses both attention and resources on those who most need them. Recognizing the validity of many of the arguments employed by the theorists of indigenous knowledge, this article attempts to generate a debate on the concept of indigenous knowledge by suggesting that there are certain contradictions and conceptual weaknesses in most of the writings on indigenous knowledge.

The presumed basis for indigenous knowledge

In the positive response that has hailed the emergence of the most recent focus of development practitioners, one may be prompted to ask what is new about the rhetoric and practice of indigenous knowledge. Surveying some of the major works on the subject, the following claims can be distinguished. Indigenous knowledge differs from Western or scientific knowledge on:

- substantive grounds--because of differences in the subject matter and characteristics of indigenous and Western knowledge;
- methodological and epistemological grounds--because the two forms of knowledge employ different methods to investigate reality;
- contextual grounds--because traditional/indigenous knowledge is more deeply rooted in its environment (Banuri and Apffel-Marglin, 1993; Chambers, 1980:2; Dei, 1993; Howes and Chambers, 1980:330; Warren, 1989 and 1990:1).

To ignore people's knowledge is almost to ensure failure in development (Brokensha et al., 1980:7-8).

Since indigenous knowledge is essential to development, it is often suggested that it must be gathered and

documented in a coherent and systematic fashion (Brokensha et al., 1980; Warren et al., 1993). As more studies of indigenous knowledge become available, its relevance to development will become self-obvious. Such studies, so the argument goes, should be archived in national and international centres in the form of databases; the information in these databases could be systematically classified. The collection and storage of indigenous knowledge should be supplemented with adequate dissemination and exchange among interested parties, using newsletters, journals and other media (Warren et al., 1993).

In accenting the importance of indigenous knowledge, however, theorists of indigenous knowledge are caught on the horns of a dilemma. (Brokensha et al., 1980; Chambers et al., 1989; Warner, 1991; Warren et al., 1991) On the one hand, their focus on indigenous knowledge has gained them an audible presence in the chorus of development. At the same time, talking about indigenous knowledge commits them to a dichotomy between indigenous and Western knowledge--a dichotomy that many earlier anthropologists, including Malinowski, Boas, Levi-Bruhl, Mauss, Evans-Pritchard, Horton and Levi-Strauss have already debated. In dazzling analyses of 'primitive' and modern cultures and systems of knowledge, Levi-Strauss (1962, 1966), for example, anticipated many of the arguments advanced today to create a demarcation line between indigenous and Western knowledge'. Levi-Strauss suggested that 'primitive' cultures are more embedded in their environments than modern cultures; 'primitive' peoples are less prone than scientific investigators to analytic reasoning, that might question the foundations of their knowledge; and 'primitive' thought systems are more closed than scientific modes of thought. Unfortunately, neither Levi-Strauss's arguments nor current attempts to separate indigenous knowledge from Western knowledge can be sustained. This article further suggests that the strategy of archiving and disseminating indigenous knowledge runs contradictory to the very conceptual basis of what is seen to be 'indigenous' in indigenous knowledge.

Problems related to the category of 'indigenous knowledge'

The attempt to create two categories of knowledge-- indigenous/traditional vs. Western/scientific--ultimately rests on the possibility that a small and finite number of characteristics can define the elements contained within the categories. But the attempt fails on each of the three counts: substantive, methodological and contextual.

Substantive differences

There are differences between indigenous and Western knowledge with respect to their history and distinctive characteristics. However, the presumption that indigenous knowledge is concerned with the immediate and concrete necessities of people's daily livelihoods, while Western knowledge attempts to construct general explanations and is one step removed from the daily lives of people, does not hold water. There is scarcely any aspect of life in the West today that does not bear the imprint of science.

At the same time, many writers on indigenous knowledge agree that it also encompasses 'non-technical insights, wisdom, ideas, perceptions and innovative capabilities' (Thrupp, 1989:139). Indeed, by what yardstick of common measure-- without creating completely meaningless categories--can one juxtapose a Hume and a Foucault, a Derrida and a Von Neumann, or a Said and a Fogel? And by what tortuous stretch of imagination would one claim that there are similarities between the Azande beliefs in witchcraft (Evans-Pritchard, 1936), and the decision-making strategies of the *Raika* shepherds in Western India (Agrawal, 1993), or between the beliefs of different cultures on intersexuality (Geertz, 1983:80-4), and the marketing activities in traditional peasant communities (Bates, 1981; Schwimmer, 1979)?

Thus, on the one hand, there are striking differences between philosophies and several forms of knowledge

commonly viewed as either indigenous or Western. On the other hand, we may also discover that elements separated by this artificial divide share substantial similarities, as, for example, agroforestry and the multiple tree-cropping systems of smallholders in many parts of the world (Rocheleau, 1988; Thrupp, 1989); agronomy, and the indigenous techniques for the domestication of crops (Reed, 1977; Rhoades, 1987); taxonomy and the plant classification systems of the Hanunoo or the potato classification systems of Peruvian farmers (Conklin 1957; Brush, 1980); or rituals surrounding football games in the United States and, to use a much abused example, the Balinese cockfight.

The classification into indigenous and Western knowledge fails not only because there are similarities across these categories and differences within them. The attempt founders at another, more fundamental, level as well. It seeks to separate and fix in time and space (i.e., separate as independent and fix as stationary and unchanging) knowledge systems that can never be so separated or fixed. In the face of evidence that suggests contact, diversity, exchange, communication, learning and transformation among different systems of knowledge and beliefs (Levi-Strauss, 1955; Wallerstein, 1974 and 1979; Wolf, 1982), it is difficult to adhere to a view that separates indigenous and scientific/Western knowledge.

Methodological and epistemological differences

Some indigenous knowledge theorists have argued that science is open, systematic, objective and analytical. It advances by building rigorously on prior achievements. Indigenous knowledge, however, is closed, non-systematic, holistic rather than analytical, without an overall conceptual framework, and advances on the basis of new experiences, not on the basis of a deductive logic (Banuri and Apffel-Marglin, 1993; Howes and Chambers, 1980). Given the failure of numerous philosophers of science, including Leibniz, Popper, Carnap, Grunbaum and Lakatos, to find satisfactory demarcation criteria between science and non-science, it is, perhaps, unnecessary to undertake a tedious investigation of the limitations of such a claim--that would constitute, as it were, a reinvention of the wheel. Most philosophers of science have long abandoned the hope of a satisfactory methodology for distinguishing science from non-science. From the collapse of Bacon's recipe for the advancement of learning, to the failure of the logical positivists of the Vienna School in the first half of the 20th century to find verification criteria that could separate science from meaningless metaphysics, to the demise of Popper's and Lakatos's demarcation principles--the history of attempts to delineate scientific methodologies is littered with the debris of shattered theories (Kulka, 1977).

Feyerabend's (1975) attacks on the dogmatism and intolerance of scientists towards insights and methods of inquiry outside established, institutionalized science are sufficiently on target that even his avowed critics accept them (Tibbetts, 1977:272). At the same time, as Dirks et al. (1994:3) remark, it was the virtual absence of historical investigation in anthropology which made cultural systems appear timeless, at least until ruptured by 'culture contact'. In such a situation it is impossible to insist upon the openness of science to attempts aimed at dislodging it, or the closed nature of traditional knowledge systems.

Contextual differences

Indigenous knowledge is often seen to exist in a local context, anchored to a particular social group in a particular setting at a particular time. Western knowledge, on the other hand, has been divorced from an epistemic framework in the search for universal validity (Banuri and Apffel-Marglin, 1993:11/13). One may well question whether such a distinction makes sense. One of the most devastating critiques of technical solution-oriented development policies of the last five decades has been that they ignored the social, political and cultural contexts in which they were implemented. But if attempts to implement Western technically oriented solutions failed because they did not recognize the imperatives entailed by different

socio-political-cultural contexts, it is likely that the so-called technical solutions are as anchored in a specific milieu as any other system of knowledge.

When contemporary philosophers of science attempt to understand what scientists do (Kuhn, 1962; Barnes and Bloor, 1982; Knorr and Cetina, 1981; Latour and Woolgar, 1979), they focus on the social moorings of science, and in so doing question the stock assessment of science as objective and rational. More recent accounts emphasize scientific practice and the context upon which scientists draw to create scientific products such as instruments, facts, phenomena and interpretations. By insisting on the 'multiplicity, patchiness and heterogeneity of the space in which scientists work' (Pickering, 1992:8), this view of science as practice and culture successfully goes beyond not just earlier epistemologies rooted in rationalism, but also the later reductive representations that saw science 'as relative to culture (Kuhn, Feyerabend), [or] as relative to interests (Sociology of Scientific Knowledge)' (Pickering, 1992:7). The discursive space thus purchased foregrounds the practices of science, and can form a valuable resource for the construction of epistemic foundations. To successfully build new epistemic foundations, accounts of innovation and experimentation must bridge the indigenous/Western divide.

In examining specific forms of investigation and knowledge creation in different countries and different groups of people, we can allow for the existence of diversity within what is commonly seen as Western or as indigenous. At the same time we can find a common link in the concentration on the ways in which 'indigenous' or 'Western' scientists create knowledge. Instead of trying to conflate all non-Western knowledge into a category termed 'indigenous', and all Western knowledge into another category, it may be more sensible to accept differences within these categories and perhaps find similarities across them.

Conserving indigenous knowledge

According to most theorists, the prime strategy for conserving indigenous knowledge is *ex situ* conservation, i.e., isolation, documentation and storage in international, regional and national archives. (Brokensha et al., 1980; Ulluwishewa, 1993; Warren, 1989; Warren et al., 1993) This is technically the easiest and politically the most convenient strategy, but it is unconsciously yet fatally at odds with the desire to maintain distinctions between scientific and indigenous knowledge.

First, if indigenous knowledge is inherently scattered and local in character, and gains its vitality from being deeply implicated in people's lives, then the attempt to essentialize, isolate, archive and transfer such knowledge can only seem contradictory. If Western science is to be condemned for being non-responsive to local demands, and divorced from people's lives, then centralized storage and management of indigenous knowledge lays itself open to the same criticism.

Second, because of the dynamic nature of indigenous knowledge and its changing character against the background of the changing needs of peoples, the strategy of *ex situ* conservation seems particularly ill-suited to preserving indigenous knowledge. Such strategies, advanced in another context to combat the erosion of biodiversity and save genetic germplasm, are increasingly being viewed as inadequate and unsatisfactory (Altieri, 1989; Falk, 1990; Hamilton, 1994; Wilson, 1992). When biologists recognize that *ex situ* conservation is a defective strategy to preserve physically distinguishable entities such as seeds and plants, it seems ironic that we are advocating the same problematic strategies to preserve knowledge which is integrally linked with the lives of people and is constantly changing. However, the ultimate irony in the attempt to valorize indigenous knowledge may lie in the willingness to adopt the methods and instruments of Western science. Thus few theorists accept the utility of indigenous knowledge in itself, and most writings first propose

the validation of indigenous knowledge by means of scientific criteria. (Massaquoi, 1993; Rajan and Sethuraman, 1993; Richards, 1980). If Western science is the ultimate arbiter of knowledge, then there seems little point in advocating the distinction between scientific and indigenous knowledge.

Different directions?

If the primary motive for highlighting the knowledge of the marginalized poor is to find them a greater voice in development, then it would seem preferable to foreground this objective, rather than framing it in terms of the confounding rhetoric of indigenous vs. Western/scientific knowledge. If indigenous knowledge systems are disappearing, it is primarily because the pressures of modernization and cultural homogenization, under the auspices of the modern nation-state and the international trade system, threaten the lifestyles, practices and cultures of nomadic populations, small agricultural producers and indigenous peoples. The appropriate response from those who are interested in preserving the diversity of different knowledge systems, might then lie in attempting to reorient and reverse state policies to permit members of threatened populations to determine their own future, thus facilitating *in situ* preservation of indigenous knowledge. *In situ* preservation cannot succeed unless indigenous populations and local communities gain control over the use of the lands on which they dwell and the resources on which they rely. Those who are seen to possess knowledge must also possess the right to decide on how to conserve their knowledge, and how and by whom it will be used.

In situ preservation may make knowledge more costly for those outsiders who wish to gain access to it for free dissemination. The mechanics of such preservation are little understood and may pose significant political and ethical challenges. To these and similar objections, there are two simple rejoinders:

- *ex situ* preservation of indigenous knowledge is likely to fail-- creating only a mausoleum for knowledge;
- *ex situ* conservation, even if it is successful in unearthing useful information, is likely to benefit the richer, more powerful constituencies--those who have access to international centres of knowledge preservation--thus undermining the major stated objective of conserving such knowledge: to benefit the poor, the oppressed and the disadvantaged.

Conclusion

This article began by questioning the presumed distinction between indigenous and Western knowledge, and this had two immediate consequences. The interrogation undermines the possibility that any piece of knowledge can be forever marked or fixed as 'indigenous' or 'Western'. Indeed, I suggest that the attempt to create distinctions in terms of indigenous and Western is potentially ridiculous. It makes much more sense to talk about multiple domains and types of knowledge, with differing logics and epistemologies. It is something of a contradiction--though an unavoidable one--that the same knowledge can be classified one way or the other, depending on the interests it serves, the purposes for which it is harnessed, or the manner in which it is generated.

Second, and more significantly, I argue for the recognition of a basic political truism. Necessarily anchored in institutional origins and moorings, knowledge can only be useful. But it is useful to particular peoples. Specific strategies for protecting, systematizing, and disseminating knowledge will benefit different groups of people in different ways. The recognition of this simple truism is obscured by the confounding labels of 'indigenous' and 'Western'. It is only when we move away from the sterile dichotomy between indigenous and Western, or traditional and scientific knowledge, that a productive dialogue can ensue which focuses on safeguarding the interests of those who are disadvantaged.

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References

- Agrawal, A. (1993) 'Mobility and cooperation among nomadic shepherds: The case of the Raikas', *Human Ecology* 21(3):261-279.
- Altieri, M. (1989) 'Rethinking crop genetic resource conservation: A view from the south', *Conservation Biology* 3(1):77-79.
- Banuri, T., and F. Apffel-Marglin. (eds) (1993) *Who will save the forests? Knowledge, power and environmental destruction*. London, Zed Books.
- Barnes, B. and D. Bloor (1982) 'Relativism, rationalism and the sociology of knowledge', pp. 1-20 in M. Hollis and S. Lukes (eds) *Rationality and relativism*. Oxford: Basil Blackwell.
- Bates, R. (1981) *Markets and states in tropical Africa: The political basis of agrarian policies*. Berkeley: University of California Press.
- Bates, R. (ed) (1988) *Toward a political economy of development: A rational choice perspective*. Berkeley: University of California Press.
- Black, J. (1993) 'Development Jujitsu: Looking on the bright side', *Studies in Comparative International*

Development 28(1):71-79.

Brokensha, D., D. Warren and O. Werner (eds) (1980) *Indigenous knowledge systems and development*. Lanham: University Press of America.

Brush, S. (1980) 'Potato taxonomies in Andean agriculture', pp. 37-47 in D. Brokensha, D. Warren, and O. Werner (eds) (1980) *Indigenous knowledge systems and development*. Lanham: University Press of America.

Chambers, R. (1980) 'Understanding professionals: Small farmers and scientists' IADS Occasional Paper. New York: International Agricultural Development Service.

Chambers, R., R. Pacey, and L. Thrupp (eds) (1989) *Farmer first: Farmer innovation and agricultural research*. London: Intermediate Technology Publications.

Compton, J. (1989) 'The integration of research and extension', pp. 113-136 in J.L. Compton (ed) *The transformation of international agricultural research and development*. Boulder: Lynne Rienner.

Conklin, H. (1957) *Hanunoo agriculture, a report on an integral system of shifting cultivation in the Philippines* Forestry Development Paper 12. Rome: FAO.

Dei, G. (1993) 'Sustainable development in the African context: Revisiting some theoretical and methodological issues', *African Development* 18(2):97-110.

Dirks, N., G. Eley and S. Ortner (1994) 'Introduction', pp. 3- 45 in N. Dirks, G. Eley and S. Ortner (eds) *Culture-power- history: A reader in contemporary social theory*. Princeton: Princeton University Press.

Evans-Pritchard, E. (1936) *Witchcraft, oracles and magic among the Azande*. Oxford: Oxford University Press.

Falk, D. (1990) 'The theory of integrated conservation strategies for biological conservation', pp. 5-10 in R. Mitchell, C. Sheviak and D. Leopold (eds) *Ecosystem management: Rare species and significant habitats*. Proceedings of the 15th Natural Areas Conference. Albany: New York State Museum.

Feyerabend, P. (1975; rpt. 1993) *Against method* London: Verso.

Geertz, C. (1983) *Local knowledge: Further essays in interpretive anthropology*. New York: Basic.

Gupta, A. (1992) Building upon people's ecological knowledge: Framework for studying culturally embedded CPR institutions. Ahmedabad: Indian Institute of Management, Center for Management in Agriculture.

Hamilton, M. (1994) 'Ex situ conservation of wild plant species: Time to reassess the genetic assumptions and implications of seed banks', *Conservation Biology* 8(1):39-49.

Hobart, M. (ed) (1993) *An anthropological critique of development: The growth of ignorance*. London: Routledge.

- Horton, R. (1970) 'African traditional thought and western science', pp. 131-171 in B. Wilson (ed) *Rationality*. Oxford: Basil Blackwell.
- Howes, M. and R. Chambers. (1980) 'Indigenous technical knowledge: Analysis, implications and issues', pp. 329-340 in D. Brokensha, D. Warren and O. Werner (eds) *Indigenous knowledge systems and development*. Lanham: University Press of America.
- Knorr Cetina, K. (1981) *The manufacture of knowledge: An essay on the constructivist and contextual nature of sciences*. Oxford: Pergamon.
- Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Kulka, T. (1977) 'How far does anything go? Comments on Feyerabend's Epistemological Anarchism', *Philosophy of the social sciences* 7:277-187.
- Latour, B. and S. Woolgar. (1979) *Laboratory life: The social construction of scientific facts*. Beverley Hills: Sage.
- Levi-Strauss, C. (1955, rpt. 1992) *Tristes tropiques*. New York: Penguin.
- Levi-Strauss, C. (1962, rpt. 1963) *Totemism*. Boston: Beacon Press.
- Levi-Strauss, C. (1966) *The savage mind*. Chicago: University of Chicago Press.
- Massaquoi, J. (1993) 'Salt from silt in Sierra Leone', pp. 48- 63 in M. Gamsler, H. Appleton and N. Carter (eds) *Tinker, tiller, technical change*. London: Intermediate Technology Publications.
- Niamir, M. (1990) *Herder' decision-making in natural resource management in arid and semi-arid Africa*. Community Forestry Note 4. Rome: Food and Agriculture Organization.
- Pickering, A. (ed) (1992) *Science as practice and culture*. Chicago: Chicago University Press.
- Rajan, S. and M. Sethuraman (1993) 'Indigenous folk practices among indigenous Irulas', [*Indigenous Knowledge Development Monitor* 1\(3\):19-20](#).
- Reed, C. (1977) *Origins of agriculture*. Hague: Mouton.
- Rhoades, R. (1987) *Farmers and experimentation*. Agricultural administration discussion paper 21. London: Overseas Development Institute.
- Richards, P. (1980) 'Community environmental knowledge in African rural development', pp. 183-95 in D. Brokensha, D. Warren, and O. Werner (eds) *Indigenous knowledge systems and development*. Lanham: University Press of America.
- Rocheleau, D. (1988) Women, trees and tenure: Implications for agroforestry. pp. 254-272 in L. Fortmann and J. Bruce. *Whose Trees? Proprietary dimensions of forestry*. Boulder: Westview Press.
- Schwimmer, B. (1979) 'Market structure and social organization in a Ghanaian marketing system', *American Ethnologist* 6(4):682-701.

- Thrupp, L. (1989) 'Legitimizing local knowledge: 'Scientised Packages' or empowerment for Third World people', pp. 138-153 in D.M. Warren, J. Slikkerveer and S. Titilola (eds) *Indigenous knowledge systems: Implications for agriculture and international development*. Studies in Technology and Social Change No. 11. Ames: Iowa State University, Technology and Social Change Program.
- Tibbetts, P. (1977) 'Feyerabend's 'Against method': The case for methodological pluralism', *Philosophy of the social sciences* 7(2):265-275.
- Ulluwishewa, R. (1993) 'Indigenous knowledge, national IK resource centres, and sustainable development', [*Indigenous Knowledge and Development Monitor* 1\(3\):11-13](#).
- Wallerstein, I. (1974) *The modern world system I*. New York: Academic Press.
- Wallerstein, I. (1979) *The modern world system II*. New York: Academic Press.
- Warner, K. (1991) *Shifting cultivators: Local technical knowledge and local resource management in the humid tropics*. Community Forestry Note 8. Rome: Food and Agriculture Organization.
- Warren, D.M. (1989) 'Linking scientific and indigenous agricultural systems', pp. 153-170 in J.L. Compton (ed) *The transformation of international agricultural research and development*. Boulder: Lynne Rienner.
- Warren, D.M. (1990) *Using indigenous knowledge in agricultural development*. World Bank Discussion Paper 127. Washington DC: World Bank.
- Warren, D.M., L.J. Slikkerveer, and S. Titilola (eds) (1991) *Indigenous knowledge systems: Implications for agriculture and international development*. Studies in Technology and Social Change No. 11. Ames: Iowa State University, Technology and Social Change Program.
- Warren, D.M., G.W. von Liebenstein and L. Slikkerveer (1993) 'Networking for indigenous knowledge', [*Indigenous Knowledge and Development Monitor* 1\(1\):2-4](#).
- Watts, M. (1993) 'Development I: Power, knowledge and discursive practice', *Progress in Human Geography* 17(2):257-272.
- Wilson, E.O. (1992) *The diversity of life*. New York: W.W. Norton.
- Wolf, E. (1982) *Europe and the people without history*. Berkeley: University of California Press.

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